

Geologic Site of the Month

April, 2014

Coastal Bedrock Geology, Cape Newagen, Southport



43° 47' 9" N, 69° 39' 35" W

Text by
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Introduction

Tourists visiting Maine often hear of its “Rocky Coast” and visit places where there are lighthouses, such as Pemaquid Point and Portland Head Light. But there is more to see than just the lighthouses, that being the solid bedrock foundation upon which the lighthouses were built. Here on the southern tip of Southport at Cape Newagen, we will see varied interesting rocks and associated features formed by wave erosion over a long period of geologic time.



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Photo by T. K. Weddle



Granite and Gabbro

To start, the photo below shows two types of rock: light and dark. The light colored rock is a granite, and the dark rock is a gabbro (Hussey and Berry, 2002). Both these rocks formed deep below the surface; here the gabbro formed earlier than the granite.



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Granitic Rock Cutting Gabbro

Along the coastal outcrop exposure, one can also see several long light-colored bodies of granitic rock cutting across the gabbro. A cross-cutting sheet of igneous rock, like this granite, is called a dike. This relationship shows that the granite is younger than the gabbro.



Photo by T. K. Weddle



Pegmatite Dike

In the center of the photo below is another granite dike (the white area on the left side of the photo is snow and ice, not a dike). This very coarse-grained variety of granite is called pegmatite. To the left of the blue backpack (arrow) there is a dark rock within the light pegmatite dike. This is part of a third dike system, and is the youngest of the series of dikes.



Photo by T. K. Weddle

Youngest Dike

The dark-colored fragment in the center of the pegmatite is a part of a dike that cross-cuts the granite and can also be seen in the upper right corner cutting into the gabbro. Based on cross-cutting relationships, this dike is the youngest of the series of dikes found at Cape Newagen.



Photo by T. K. Weddle



Differential Weathering

The interesting pattern seen in this photo is caused by differential weathering. The holes in the rock surface have worn down by wave action. The thin quartz veins stand out because they are harder and more resistant to weathering than the surrounding rock.



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Quartz Veins

The raised lines in this rock are also caused by weathering; the less resistant gabbro is worn down by wave action leaving the more resistant thin quartz veins raised along the rock surface (arrows).



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Directions

Coming east from Wiscasset or west from Damariscotta along U.S. Route 1, take Exit 27 south to Boothbay Harbor. Continue on Route 27 south (watch for signs to Newagen Inn). When you see the green and gold sign, “Newagen Colony & Seaside Inn”, continue straight to the Inn. Contact Jason, the manager of the inn for permission to view outcrops.



Photo by T. K. Weddle



References

Hussey, Arthur M., II and Berry, Henry N., IV, 2002, [Bedrock geology of the Bath 1:100,000 map sheet, coastal Maine](#); Maine Geological Survey, Bulletin 42, 50 p. report, 58 figs.

